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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,597	04/13/2006	Thierry Aubert	FR-AM 1982 NP	1566
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ARKEMA INC. PATENT DEPARTMENT - 26TH FLOOR 2000 MARKET STREET PHILADELPHIA, PA 19103-3222				
EXAMINER				
BOYLE, ROBERT C				
ART UNIT		PAPER NUMBER		
4131				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/575,597

**Applicant(s)**

AUBERT, THIERRY

**Examiner**

ROBERT C. BOYLE

**Art Unit**

4131

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 4/13/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☒ Claim(s) 3-5 and 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/ISD)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date 4/13/2006

### **DETAILED ACTION**

#### ***Claim Objections***

1. Claims 3 and 4 are objected to because of the following informalities: the words "either of" were not deleted when correcting the multiple dependency. Appropriate correction is required.
2. Claim 5 is objected to because of the following informalities: the words "one of" were not deleted when correcting the multiple dependency. Appropriate correction is required.
3. Claim 8 is objected to because of the following informalities: a space is missing between the "a" and "vulcanizable" that has been added in the first line of the claim. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 gives two percentages 10-90% of product I and 10-90% of product II but does not say whether this is mol % or wt %.

#### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ecsedy, U.S. Patent 3,968,062.
8. Claim 1 discloses a vulcanizing agent comprising the combination of 10-90% a polysulfide of formula I and 10-90% a urea of formula II. Ecsedy teaches using the polysulfide of formula I (column 1, lines 7-9, 40-55) in the presence of a co-vulcanizing agent (column 4, lines 6-13). Ecsedy teaches adding the two in amounts of 1.08 of the sulfide and 0.75 of the co-agent (column 6, lines 58-59). Ecsedy does not teach using the urea of formula II.
9. Ecsedy does teach a co-agent of diethylthiourea (column 4, lines 6-13). One of ordinary skill in the art at the time of the invention would have realized that oxygen is a well known substitute for sulfur and therefore the sulfur in the thiourea could be replaced with oxygen to form a urea.
10. Claims 2, 5, and 6 disclose details of the polysulfide. Ecsedy teaches the limitations: R is a t-Bu group, disulfide linkages are preferred and the repeating units can be 0, 1, 2, or a higher integer (column 1, lines 48-67).
11. Claims 3 and 4 disclose details of the urea: having alkyl radicals or hydrogens as R' and R". Ecsedy teaches diethyl thiourea which has both ethyl groups and hydrogens on the urea (column 4, lines 10-11).
12. Claim 7 discloses the average value of n and n' is 2 and the average value of p is about 5. Ecsedy discloses disulfides with 27% sulfur (column 3, lines 63-64). The disulfides with R as t-butyl and with a p of 5 give 26.7% sulfur and disulfides with a p of 6 give 27.1% sulfur. Therefore, the disulfides used by Ecsedy had an average p value of about 5.

13. Claim 8 discloses a method for vulcanizing an elastomeric composition of the EPDM type comprising the incorporation of an effective quantity of the vulcanizing agent described in claim 1.

14. Ecsedy teaches using an effective quantity of the aryl disulfides and a urea co-agent to vulcanize polymers (column 1, lines 7-9, 40-55, column 4, lines 6-13; column 6, lines 5-25). Ecsedy also teaches vulcanization of copolymers of butadiene and other polymerizable olefins (column 1, lines 18-35). One of ordinary skill at the time of the invention would realize that propylene and ethylene are copolymerizable with butadiene.

15. Claim 8 states a property of the vulcanization agent disclosed in claim 1: presenting no risk relative to formation of nitrosamines. Ecsedy does not elaborate on this property. However, since the same vulcanization agent that is disclosed in claim 1 is taught in Ecsedy, one of ordinary skill in the art would expect that the vulcanization agent of Ecsedy would have the same properties as the vulcanization agent disclosed in claim 1.

16. Claims 10 and 11 disclose the quantity of vulcanizing agent is between 0.4-6 or 0.8-3 parts by weight per 100 parts by weight of elastomer. Ecsedy teaches 2 parts by weight agent: 0.25 TMTMS, 0.5 disulfide, and 1.25 MBTS, per 100 parts by weight elastomer: 65 enjay butyl, 25 natural rubber, and 20 whole tire reclaim (column 6, lines 5-25).

17. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ecsedy in view of Rowland et al., U.S. Patent 5,326,828.

18. Claim 1 discloses a vulcanizing agent comprising the combination of 10-90% a polysulfide of formula I and 10-90% a urea of formula II. Claim 4 discloses the R groups on the urea are hydrogen. As noted above, Ecsedy suggests the presently claimed composition with

exception of expressly teaching the use of urea. Assuming for the sake of argument that urea is not an obvious variant of the diethylthiourea, Rowland teaches using urea with a disulfide system to cure elastomers (abstract).

19. One of ordinary skill in the art at the time the invention was made would have been motivated to modify the vulcanizing agents in Ecsedy with the urea taught in Rowland because Rowland teaches a sulfide curative system that increases cure rate and reduces the amount of accelerator and minimize the presence of nitrosamine byproducts (Rowland: abstract; column 2, lines 14-19). Therefore, the invention as a whole would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made.

20. Claims 2-7, 10, and 11 are rejected for the reasons listed above in the rejection over Ecsedy alone.

21. Claim 8 states a property of the vulcanization agent disclosed in claim 1: presenting no risk relative to formation of nitrosamines. Rowland teaches this limitation (column 2, lines 26-28).

22. Claim 9 discloses the elastomer has one or more terpolymers of ethylene, propylene and ethylidene norbornene. Rowland teaches ethylene-propylenediene rubber (column 3, line 68).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT C. BOYLE whose telephone number is (571)270-7347. The examiner can normally be reached on Monday-Friday 9:00am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571)272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/  
Supervisory Patent Examiner  
Art Unit 4131

/R. C. B./  
Examiner, Art Unit 4131